

HULLETT PROVINCIAL WILDLIFE AREA MANAGEMENT PLAN



Ontario

**Ministry of
Natural
Resources**

HULLETT PROVINCIAL WILDLIFE AREA
MANAGEMENT PLAN

March, 1985

Approval Statement

The Wingham District Office of the Ministry of Natural Resource wishes to thank all interested citizens, local landowners, Hullett Township Council, Huron County Council, and the Maitland Valley Conservation Authority for their support and cooperation in making this concept for a Provincial Wildlife Management Area in Hullett a reality.

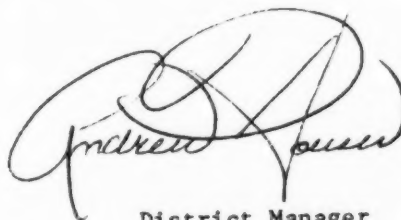
A special thank you is also extended to Ducks Unlimited Canada, a private, non-profit organization dedicated to preserve, develop, restore and maintain waterfowl breeding habitat in Canada. Ducks Unlimited Canada through its Head Office in Winnipeg, Manitoba and Provincial Office, in Barrie, Ontario agreed to develop, maintain and manage a dyking system for the water impoundments. The dyke system was completed in 1983.

The management staff for the Hullett Provincial Wildlife Area will maintain an on-going close liaison with the users, adjacent landowners and members of the Hullett Township Council in order to ensure that the development and management of the wildlife management area is carried out with the needs and desires of the public in mind.

We are pleased to approve the Hullett Provincial Wildlife Area Management Plan as the policy for the continuing development and management of this wildlife area over the next 20 years. This plan reflects the Ministry's interest to create and manage a significant wetland area that will provide habitat for a wide variety of waterfowl and other wildlife, and to create high quality opportunities for wildlife based recreation and heritage appreciation. Other resource benefits will also accrue from the management of this area for wildlife purposes.



Regional Director
Southwestern Region



District Manager
Wingham District

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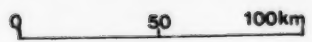
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Regional Setting

Figure 1



LEGEND

- Regional Boundary
- - - District Boundary
- . - International Boundary
- Regional Office
- District Office
- Wingham District
- ▲ Hullett Provincial Wildlife Area

INTRODUCTION

Wetlands are vital to the preservation of waterfowl and to the food chains of fish. They play an important role in maintaining and controlling water resources; and they supply essential outdoor recreation for our industrialized society.

Recognizing the need for conservation and expansion of wetlands, the Wildlife Branch of the former Department of Lands and Forests assessed a number of areas in southwestern Ontario in the early 1960's. The Branch was specifically seeking a dryland site which could be artificially flooded to create a true marsh habitat where manipulation of water levels would allow for flexible management. An area in Hullett Township was selected as having the greatest potential for future development as a waterfowl habitat.

Subsequently, the Maitland Valley Conservation Authority in 1969 approved in principle the Lands and Forests' proposal "to create an impoundment in Hullett Township for waterfowl management". In 1970, a public meeting was held to clarify misunderstandings with respect to purchase of land, and ultimately the township was awarded a grant to cover the equivalent of the tax base lost as a result of private lands having been acquired by the province.

In 1973, it was agreed that the Ministry of Natural Resources would provide detailed planning for the area, while the county and township would work together to determine "support recreational facility" opportunities generated by the project, as well as to ensure that development of private lands would not adversely affect the wildlife area. The Ministry carried out engineering and hydrology studies in 1973-74 and master planning commenced in 1973 with approval in 1979. Much of the background information collected during this planning exercise appears in Appendices 1 to 9. This management plan is a revision of the 1979 master plan incorporating current information and emphasizing the integrated management approach being taken.

The Hullett Provincial Wildlife Area is located in Hullett Township in Huron County, 6.5 km northeast of the town of Clinton. It comprises 2,200 ha of land lying on both sides of the South Maitland, the southernmost tributary of the Maitland River which flows into Lake Huron at Goderich. Approximately 800 ha were low-lying lands which flooded naturally every spring. The Hullett Provincial Wildlife Area possesses the additional advantage of a contrasting area of rolling uplands covered with forest and open meadows, peripheral to the flood plain. Figure 5 in Appendix 3 shows the original vegetation communities.

Diversity of wildlife species reaches its peak in the spring and fall when many species of migratory birds complement the indigenous wildlife populations. Ducks and geese are especially attracted for nesting and feeding from nearby migratory flyways along the Lake Huron shoreline. It is this annual waterfowl phenomenon which initiated the hypothesis that if the area could be permanently flooded, it would constitute a major waterfowl habitat location within Southwestern Ontario.

After detailed study by Ducks Unlimited Canada, the concept of extensive dyking structures parallel to the South Maitland River was determined to be the best approach for achieving the full management potential of the marsh habitat. The result has been the creation of seven major impoundments, totalling 750 ha (Appendix 6).

The area has the potential to serve as an open air laboratory where current techniques designed to interpret wildlife values and outdoor appreciation can be assessed as well as research to evaluate existing wildlife and resource management techniques. Careful assessment of the project could contribute to many aspects of the biological sciences.

In addition to its conservation, recreation and research functions, the area has the potential to produce other natural resource related benefits. Under appropriate conditions, additional benefits can be derived from mineral, aggregate, and petroleum resources, forest management and outdoor education. The District Land Use Guidelines identifies the district's targets associated with these benefits and these are listed in Table 1.

The Hullett Provincial Wildlife Area is identified as a special regulation area under The Game and Fish Act, R.S.O. 1980.

GENERAL MANAGEMENT POLICIES

Goal

The goal of the Hullett Provincial Wildlife Area is to manage its resources to provide opportunities for high quality, wildlife-based, day-use, recreational experiences for the people of Ontario.

One of the fundamental underpinnings of the recently approved District Land Use Guidelines is the concept of "integrated resource management" which is defined as:

....the coordination of resource management programs to ensure that conflicts are minimized and to encourage management which would benefit several programs. Integrated management encourages multiple use, but recognizes that in some circumstances, management of areas for a single purpose may be necessary (Wingham District Land Use Guidelines, 1983, p.61).

Two of the strategies adopted by Wingham District to achieve integrated resource management are:

1. Every effort will be made to ensure that each ministry program contributes to or accommodates the objectives of other programs.
2. Wherever appropriate, public lands set aside for natural resource management purposes may serve to achieve more than one program objective simultaneously or, where suitable, sequentially (Wingham District Land Use Guidelines, 1983, p.11).

Objectives

Within this goal for the Hullett Provincial Wildlife Area and consistent with the principles of integrated resource management the objectives in order of importance are:

- to manage the area for waterfowl and a range of benefits to wildlife;
- to provide public hunting opportunities;
- to provide other resource-based recreational opportunities;
- to provide resource-based educational opportunities;
- to manage forests within the area for production of wood products when consistent with the goal; and
- to provide other resource-based opportunities consistent with the above.

Zoning and Contributions to Resource Management Targets

The Hullett Provincial Wildlife Area has an internal zoning system to guide management activities, to identify particular important features and to separate differing uses. The zones are (see Figure 2):

- Prehistoric Site - identifies the location of an archaeological resource (for details see Appendix 1);
- Access and Development Zone - identifies the public access roads, parking areas and facilities;
- Wetland Management Zone - identifies the pond system and dykes. The management of this zone focuses on waterfowl staging and production; and
- Upland Management Zone - identifies the dry land areas where a wide variety of resource activities and benefits will be managed.

The objectives will be met throughout the entire property with the following exceptions:

- forestry benefits are not possible within the Wetland Management Zone (Figure 2);
- aggregate extraction is not desirable on the prehistoric sites (Figure 2); and
- access, visitor services and development zones (Figure 2) will be utilized solely for access and administrative purposes.

Each zone contributes, to varying degrees, to the resource management targets for Wingham District (see the Wingham District Land Use Guidelines). Table 1 outlines the contributions provided by the integrated management of the Hullett Provincial Wildlife Area. Appendix 10 outlines guidelines for a variety of activities that require further restrictions.

TABLE 1

Summary of Targets: Wingham District - related to
the Hullett Provincial Wildlife Area

Activity	District Target	Hullett Target	Zone at Hullett ^{1.}
Waterfowl Hunting	15,800 opportunities/year	3,500	wetland
Small Game Hunting	62,600 opportunities/year	2,800	upland
Deer Hunting	3,000 opportunities/year	*	upland
Wildlife Viewing	no target identified yet	*	upland, wetland
Fur Production	36,000 pelts/year	*	upland, wetland
Bait Fisheries	148,500 dozen/year	*	wetland
Sports Fisheries	137,300 opportunities/yr	*	wetland
Commercial Fisheries	400,000 kilograms/year	n/a	n/a
Endangered Species	nil	n/a	n/a
Life Science features	9 significant features	n/a	n/a
Earth Science features	23 significant features	1	upland
Swimming	219,600 swimming opportunities/year	n/a	n/a
Picnicking	59,300 picnicking	*	access and development
Developed Camping	96,200 camping opportunities/year	n/a	n/a
General Recreation	no target identified yet	*	n/a
Net Merchantable Wood	116,000 cubic metres	*	entire area
Fuelwood	no target identified yet	*	upland
Mineral Aggregate Resources	93 million tonnes	*	upland
Non-Aggregate Mineral and Fossil Fuel Resources	no target identified yet	*	upland, wetland

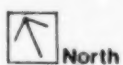
n/a not applicable

* will contribute in part to the district target but amount either not known or identified. Waterfowl production target for H.P.W.A. will be set once development of wetland complete

1. Zones identified in Figure 2

Zoning

Figure 2



0 1 km



LEGEND

-  Access and Development Zone
- W** Wetland Management Zone
- U** Upland Management Zone
- P** Parking

Resource Management Principles

1. Emphasis will be on management for spring and fall migrant waterfowl because of the site's location relative to continental flyways. Management for waterfowl production is also of primary importance. Marshes will be held to an average depth of 60 cm which is considered most attractive for waterfowl. All impoundments can be drawn down independently as needed to permit rejuvenation of the aquatic habitat. They also have the capability to hold water levels high enough to set back the encroachment of emergent aquatic vegetation when necessary.

Pool A (Figure 8) water levels will be managed to maintain live standing timber, as long as it is possible to provide a particular habitat for certain species, such as wood ducks. The marketable timber from all other impoundments was removed prior to flooding.

The grassland areas surrounding the wetland management zones will be maintained and managed for waterfowl nesting.

2. Production of self-sustaining upland wildlife populations will be encouraged through the creation of a strong habitat management program. Native species do not fully utilize grassland habitat required for nesting waterfowl so other species (ringneck pheasant, bobwhite quail) will be stocked to provide hunting opportunities to meet the small game hunting target. These other species may become self-sustaining as winter habitat conditions improve in the wetland management zone.
3. Retention of rare and/or endangered native species of plants and animals will be fostered wherever possible.
4. Selected lands will be available for private agricultural use in a manner beneficial to wildlife and other operations in the management area. High priority will be given to a lure crop program to discourage crop depredation outside the Hullett Provincial Wildlife Area.

Noxious weeds will be a prime concern and appropriate methods of control will be undertaken.

5. Waterfowl feeding will be undertaken and refuge areas will be maintained.
6. Harvesting of furbearers to maintain them at a desirable level will be practiced.
7. Bait fish harvest will be allowed with controls as needed to prevent disruption of waterfowl production and to maintain sustained bait fish yields.
8. Woodland areas in the Upland zone (Figure 2) will be managed to ensure good wildlife cover, sound forestry management practices including timber production, and provision of aesthetic areas for walking, photography, biological research, upland game hunting, etc.
9. Exploration for mineral resources and gas and oil will be permitted. Extraction of these resources may occur, depending on a thorough review in conjunction with the goal and objectives of the area, evaluation of the

practicality of sequential land-use and demonstration that there will be no detrimental impact on the quality and integrity of the Wawanosh-Seaforth Moraines earth science area of natural and scientific interest (A.N.S.I.).

Recreational Use Principles

1. Activities in the wildlife management area will be on a day use basis only.
2. Opportunities for high-quality sport hunting will be maximized. The numbers of hunters will be controlled for proper wildlife management.

Restricted areas will be established where necessary.

3. Visitor services programming will be based on self-use facilities and will consist of four components - provision of basic area use information, interpretation, recreation programming, and education.

Programming will be linked with that offered by other provincial wildlife areas and wildlife agencies such as Ducks Unlimited Canada.

Visitor control will be exercised in some locations at certain times of the year i.e. to reduce disturbances to breeding waterfowl and other nesting birds (see Appendix 10).

4. Naturalists, students and Ministry of Natural Resources staff will be encouraged to use the area as an educational "laboratory".
5. Sport fishing will be permitted in certain areas with restrictions as needed to prevent serious disruption to waterfowl production and related recreation, and to allow sport fish populations to thrive (see Appendix 10).
6. Motorized vehicles will not be allowed off maintained roads except for authorized management purposes. Snowmobiles will be accommodated, but limited to a marked trail when snow cover of 15 cm is reached. Use of outboard motors will not be permitted.
7. Where appropriate, fees may be charged for activities.
8. Extension service may be available to adjacent landowners (e.g. design of campgrounds, flood easement and drainage, use of private lands for hunting, etc.).

Facility Management

The maintenance complex, providing a workshop area and storage facilities for Hullett and other Wingham District equipment (e.g. vehicles, boats, feed and general supplies), is located in Lot 8, Concession III. In addition to the original

structure, a building having one heated maintenance area plus three cold storage bays was constructed in 1982.

The municipal roads within the wildlife management area became the property of the Ministry of Natural Resources and were closed prior to any major development. Parking lots in peripheral areas have been sited to limit and distribute hunting activity throughout area. Parking lots were placed near facilities such as gravel roads, observation towers, fish ponds and access points for boat launches.

A visitor services facility and administrative office has been proposed in the northwest area of the property on Lot 17, Concession IV. This proposal would improve customer service and may be given serious consideration particularly if use of the area approaches levels predicted in Appendix 7. Minor acquisitions of adjacent lands to complete the boundary of the Hullett Provincial Wildlife Area may occur should such lands become available for purchase.

Fencing agreements with neighbouring landowners will be entered into where required and the boundary of the Hullett Provincial Wildlife Area appropriately identified with signs both to inform and direct use of the area by the public.

Annual maintenance and operational requirements are gravelling and grading access roads and parking lots, replacing damaged signs, garbage pickup, snow removal from administrative building parking lot, provision of washroom facilities during waterfowl hunt, replacement or repair of nesting boxes, noxious weed control, and printing of information brochures regarding the features of Hullett and the areas open to hunting.

Research

Wingham District will also cooperate with universities for research purposes. Written research proposals and authorization by the District Manager will be required.

Areas that were formerly used as farmland and are not essential to wildlife management may be suitable for long term forest research projects. Eight ha have been set aside as a white pine seed orchard.

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APPENDICES

APPENDIX 1

PAST HISTORY

Three Indian sites within the Hullett Provincial Wildlife Area have been identified by a preliminary archaeological survey (Swaze, 1972) as being worthy of further investigation. Pottery fragments have been found which are distinctive to the Saugeen peoples (60 B.C. - 200 A.D.) and late prehistoric Iroquoians (1450 - 1600 A.D.).

European settlement was slow to arrive due to social and economic conditions, hindered by the poorly drained low land. The first settlers arrived in 1848, but it was many years later before all the land was in agricultural use.

APPENDIX 2

SETTING

Climate

Climate and weather conditions are similar to the nearby towns of Clinton and Brucefield. Mean annual snowfall is 258 cm with the heaviest falls in December, January and February. Rainfall is equitably distributed with about 62.5 mm from April to October inclusive. However, weather conditions in the area are unpredictable and often radically alter the environment. In winter, strong wind can result in drifting snow, periodic ice storms cause damage, and melting on isolated high temperature days leads to "crust" formation when the temperature drops again.

Rapid thaw and jamming of ice blocks in the river, augmented by spring rains, cause flooding for a period of two to three weeks. Standing waters remain in some bush areas well into early summer, creating conditions where mosquitoes thrive.

Summer days are characterized by daily temperatures of 24 degrees to 30 degrees Celsius with light winds, and flood plain lands dry out as a result of evaporation. Occasionally, the site has flooded in the fall as the result of heavy rainstorms.

Drainage

The South Maitland River, with a total length of 27.4 km, rises at 337.5 m above sea level and flows westward to join the main branch of the Maitland River in Goderich Township. The eastern boundary of Hullett is located 14.5 km downstream from the source and the northern boundary 22.5 km from the source. Total watershed drainage area is 409 sq km.

The river is characterized by considerable fluctuations in flow. Within the Hullett Provincial Wildlife Area, the pattern is for flooding of the lowlands to occur in March and April. At other times of the year, following heavy rainstorms, flooding can occur within twenty-four hours.

Surface drainage has been facilitated by the construction of a system of drainage channels and pump facilities, the majority of which lead into the South Maitland River. In the southwest corner the "Bean" ditch leads surface waters southward into the Bayfield River system.

APPENDIX 3

RESOURCE ANALYSIS

Mineral Resources

The area is entirely underlain by the 20 m thick Dundee Formation limestone of Middle Devonian Age (Liberty and Bolton, 1971). The Dundee limestones are underlain by dolomite and limestone of the Detroit River Formation. The bedrock surface is relatively flat and is covered by 15 to 45 m of unconsolidated drift. There are no bedrock outcrops in the area.

Except for some minor organic and alluvial deposits, all unconsolidated drift is of glacial origin, deposited during the late Wisconsinan Substage of the Pleistocene Epoch, the last continental glaciation of North America. This glacial drift forms four physiographic units in the Hullett Provincial Wildlife Area (Figure 3):

1. the Seaforth moraine which trends northeasterly through the southern and western part of the area;
2. the Wawanosh moraine in the northwest;
3. a large area of ground moraine in the east and northeast; and
4. a large area of glaciolacustrine sediments in the central part of the area.

The Wawanosh-Seaforth Moraine form an area of high, hummocky ground with a relief of 23 to 30 m. They are composed mainly of ice contact gravel, sand, silt and till and are mantled by a thin layer of silt till. Some deposits of outwash sand with minor gravel occur on the flanks of the moraines in the west. The ground moraine which is part of the Rannoch till sheet (Cooper et al, 1977) is a yellow-brown silt to sandy silt till, similar to the till which mantles the moraines. The glaciolacustrine sediments form a flat plain which was formerly part of the floodplain of the South Maitland River and is now occupied by the waterfowl impoundments. The sediments consist of horizontally stratified fine sand, silt and clayey silt.

The meeting of the Wawanosh-Seaforth Moraines (Cordiner, 1982) is considered to have significant scientific value for the interpretation of the glacial history of Ontario. Consequently, a large part of this feature, including the portion exposed in the southeast part of the management area is identified as an Area of Natural and Scientific Interest (A.N.S.I.). The report for the Wawanosh-Seaforth Moraines (A.N.S.I.) as identified in the Wingham District Land Use Guidelines is in Appendix 9.

Soils in the management area are closely related to the underlying geologic material. Depending on drainage and textural variations Harriston, Donnybrook and Parkhill loam soils have developed on the Wawanosh-Seaforth Moraines. Listowel loam occurs in the low lying land immediately south of the river. On the north side occur Toledo silt, Parkhill and Brookston clay loams, and Perth clay loam, all of which have poor natural drainage in this low lying area. The Canada Land Inventory (1968, 1969) rates the Donnybrook soil in classes 4 to 6 for agricultural capability, which

indicates it has severe limitations. The remaining soils are classes 1 to 3, varying from highly productive to having moderately severe limitations for agriculture.

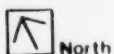
There has been no mineral resource production other than a minor amount of sand and gravel removed in the past from the Wawanosh-Seaforth Moraines. Potentially significant amounts of sand and gravel occurs on parts of Lot 13, Concession II and Lot 20, Concession III. Potentially large reserves of sand occur on Lots 15 and 16, Concession III (Figure 4).

One oil and gas exploratory well was drilled on Lot 16, Concession IV in 1938, but no petroleum was discovered. There is good potential for finding oil and natural gas pinnacle reefs in the Guelph formation bedrock. Potential reservoirs are probably small consisting of natural gas with little or no oil.

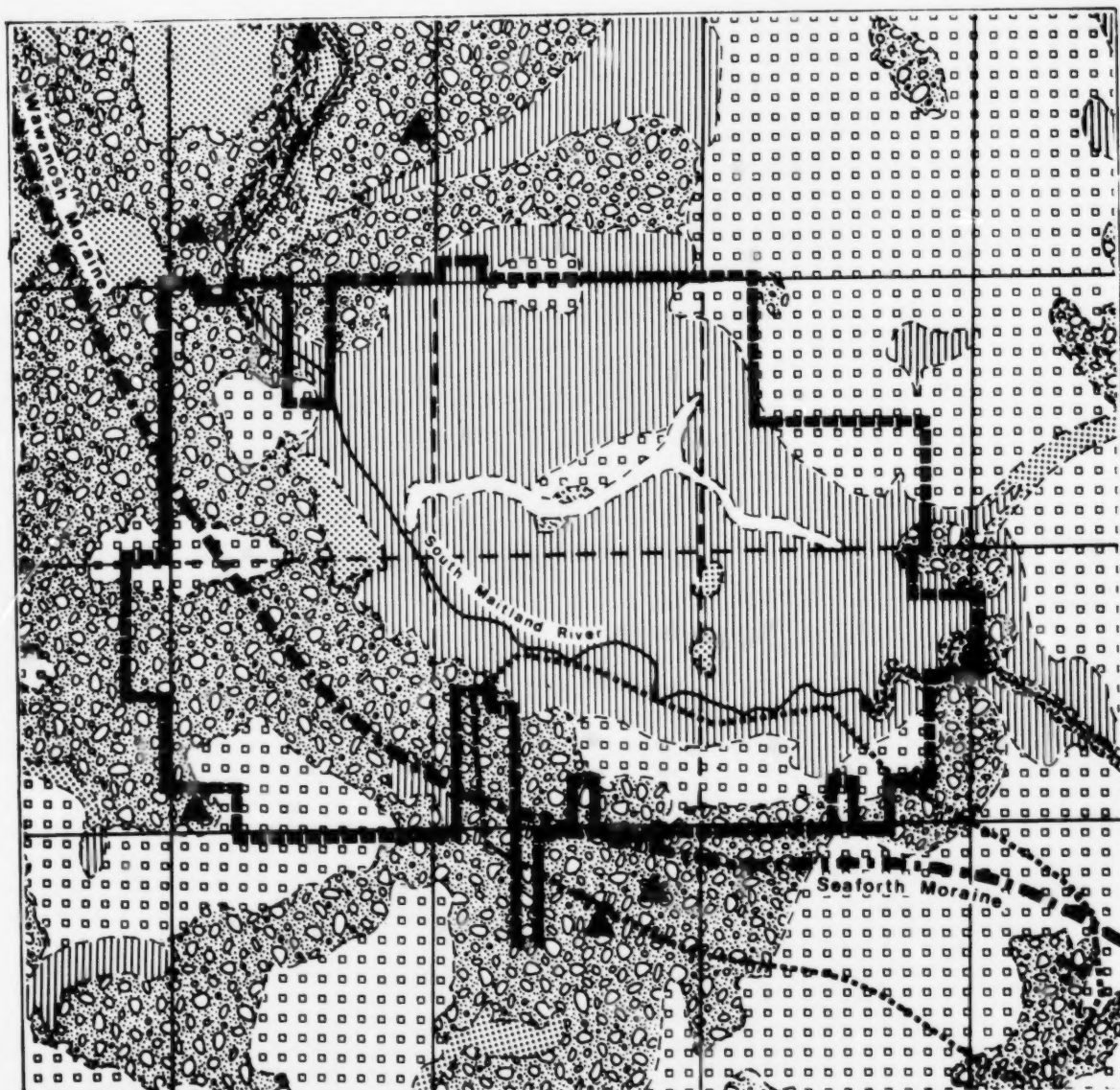
There has been no detailed exploration for or development of other potential mineral resources within the management area. Salt and limestone are known to occur in the bedrock formations and may have some potential for development. Gypsum, lead and zinc may also be present.

Geology

Figure 3



0 1 2km



LEGEND

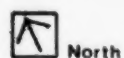
- RECENT**
- Alluvial deposits: stream deposits of gravel, sand and silt
 - Organic deposits: peat, muck

PLEISTOCENE

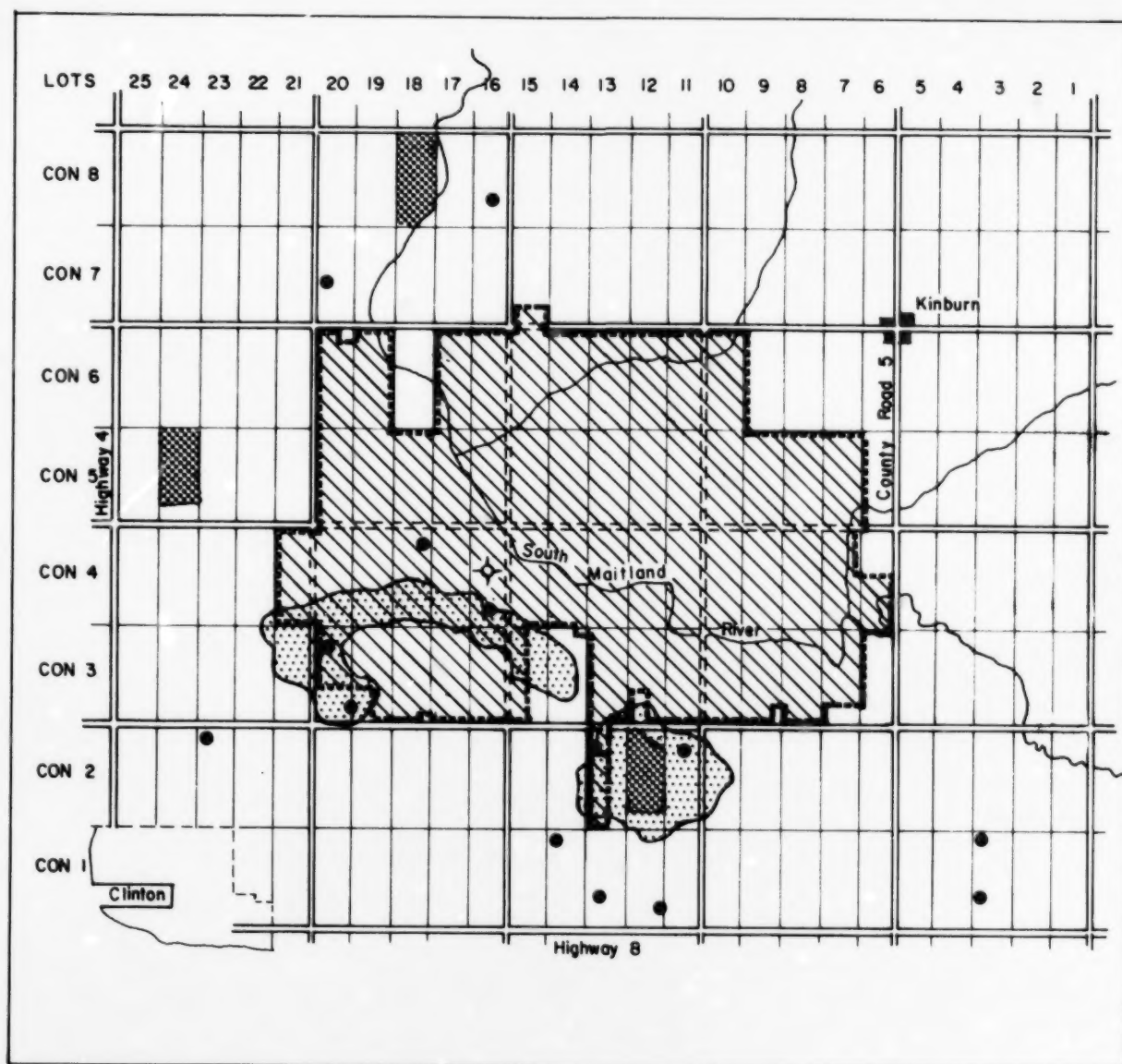
 - Glaciolacustrine deep water deposits: sand, silt and clay
 - Glaciofluvial outwash deposits: sand, minor gravel
 - Rannoch Till: silt to sandy silt till
 - Ice-contact stratified drift: sand and gravel
 - Hullett Provincial Wildlife Area
 - A.N.S.I. boundary
 - Moraine crest
 - Sand or gravel pit
 - Esker

Mineral Aggregate & Petroleum Resources

Figure 4



0 1 2km



LEGEND

- Hullett Provincial Wildlife Area
- Primary Aggregate Resource Areas
- Licensed Pits
- Abandoned Pits
- Dry Hole

Flora and Fauna

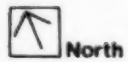
The Hullett area has an interesting, if not unique, biology originating from the effects of the annual flooding of approximately 800 ha of land each spring. An edaphic climax silver maple-ash forest association has developed in the poorly-drained depressions and stream valleys with some rare and uncommon plants, such as green dragon (Arisaema dracontium). Upland and other well-drained sites contain sugar maple, beech, white ash, cherry and basswood. The small patches of hemlock-birch white cedar communities are shown on (Figure 5), Vegetation Communities. The forested land consisted of approximately 68 ha of upland hardwood, 248 ha of lowland hardwoods, 39 ha of conifers and 169 ha of shrublands. Clear cutting operations in the impoundment areas has reduced forest cover by approximately 200 ha.

Fauna is representative of the Great Lakes-St. Lawrence forest region. Great blue herons have nested in the area. Potential of the river for sport fishing is not good due to low summer flow and high water temperature.

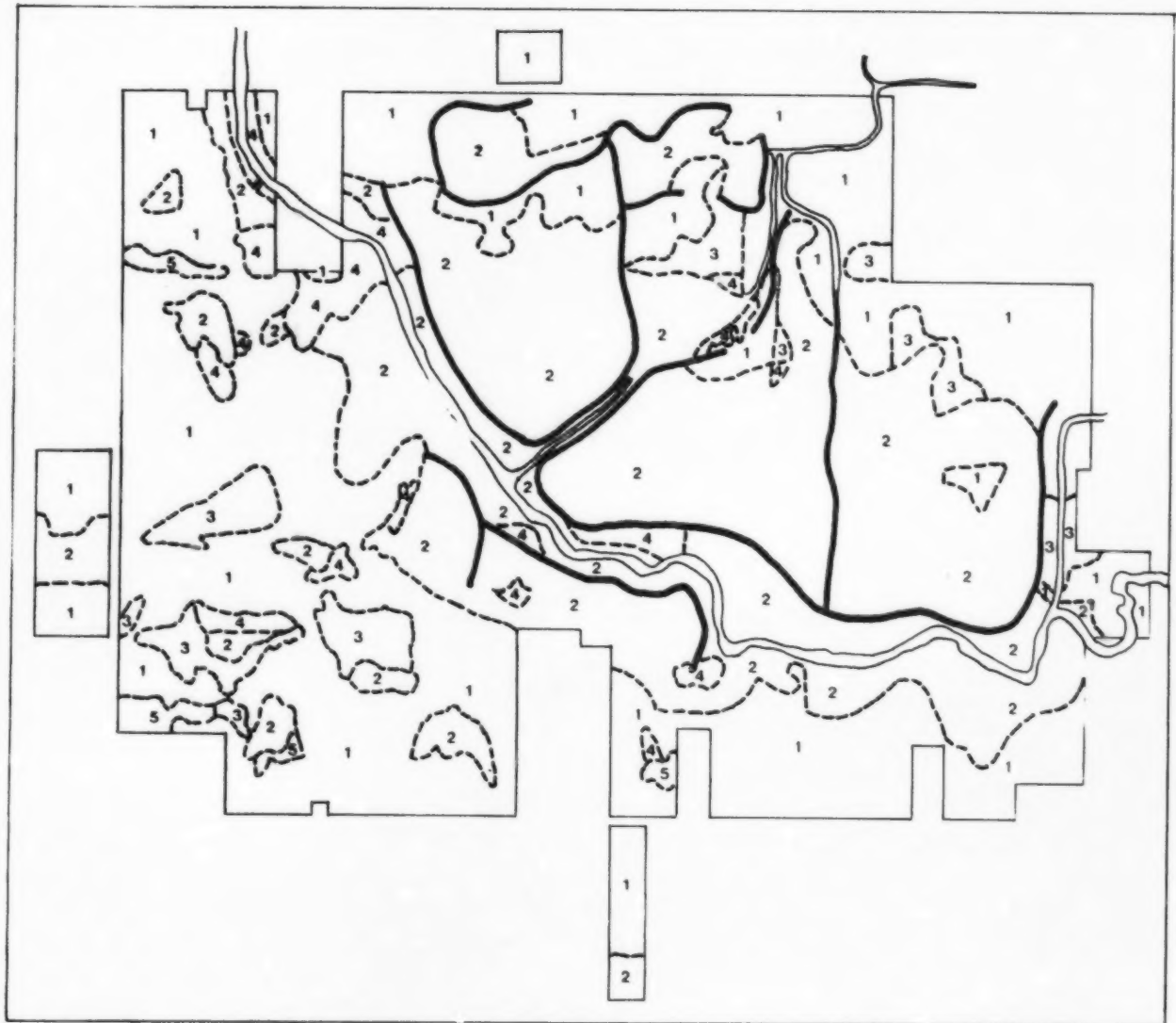
As has been noted, diversity of waterfowl reaches its peak in the spring and fall migration, when mallard, black duck, pintail, blue-winged and green-winged teal, wood duck, American wigeon, American coot, and others can be viewed.

Vegetation Communities (1976)

Figure 5



0 1 km



LEGEND

- 1 Upland Meadow and Shrub
- 2 Wetland Meadow and Shrub
- 3 Upland Hardwood
- 4 Wetland Hardwood
- 5 Hemlock-Birch-White Cedar

APPENDIX 4

PRESENT LAND USE

Prior to acquisition, the site consisted of twenty-five mixed-use farms. Adjoining the Hullett Provincial Wildlife Area landbase on all sides at present are private farms. Land use peripheral to the boundary has a crucial impact on the environment of the Hullett Provincial Wildlife Area. The land has been zoned as open space by the Huron County Planning Board with adjacent lands zoned as agricultural.

Present use reflects the dual ownership situation within Hullett. Ninety percent is owned by the Ministry of Natural Resources with approximately 1990 ha managed for wildlife production and 210 ha planned for agricultural use. The remaining 230 ha are privately owned farms with the exception of one vacation cottage. Crops are mainly corn and hay with some oats, barley and beans. In addition, there are several dairy and hog farms on the periphery of the wildlife area.

Present development includes 20 km dykes and 17 water-level control structures, three maintenance buildings, an inflammable materials storage building, a radio tower, parking lots, a corn crib, granaries, goose enclosure, two viewing platforms, three pheasant pens, two put-and-take fish ponds and six kms of gravel surface roads.

Upland game and waterfowl hunting has been available since 1974. Due to increased demand, controls on the number of hunters and access were implemented in 1982.

The area also serves a utility function for surrounding residents. A system of municipal ditches has been constructed to aid in draining the area. A 115 KV wood pole Ontario Hydro transmission line traverses the south section. Hydro wires pose a potential hazard to birds as well as having a negative visual impact. Ontario Hydro is presently looking at the area as a possible site for a transformer station.

APPENDIX 5

REGIONAL MARKET ANALYSIS

Approximately 20 km west of the Hullett Provincial Wildlife Area is the Lake Huron shoreline, a focus of recreational activities which attracts visitors from the urban centres of Southwestern Ontario and neighbouring states.

The adjacent town of Clinton is situated in the centre of an agricultural area specializing in livestock and cash crop production, which extends approximately 100 km to the north, south and east. At the southern and eastern limits of this agricultural area is Highway 401. Approximately 160 km north of Hullett is the base of the Bruce Peninsula, a major tourist area (Figure 6).

The market area for Hullett is defined as that from which visitors would be prepared to travel for day-use activities. Hunters will constitute the prime user group during the season from October to the end of February. During the balance of the year, it is anticipated that user groups will consist of naturalists, wildlife photographers, hikers and students.

It was decided that a 1-1/2 (Cox, 1971) hour travel isochron was a realistic limit for the majority of day-use. In 1971, the population within this zone was approximately 730,000. Projected population to the year 1991 is 946,640 (Cox, 1971)

Fall hunting figures were calculated on weekend/holiday use to be of capacity with a use factor of one-third during weekdays. Waterfowl hunting days, based on 607 ha of marsh with two hunters per 10 ha, totals 3,100. A formula of one hunter per 4 ha for upland game resulted in 1,400 days. In addition, it was estimated that of the 3,600 ha of private land within the impact area (Figure 7), potentially half should be put under a hunting agreement. A figure of 1,707 hunter days was calculated on the basis of one-half the use of the management area and a density factor of two hunters per farm. Winter upland game hunting on Hullett Provincial Wildlife Area and private land was estimated at half the use of fall hunting for a total of approximately 1,400 days.

It is more difficult to calculate non-hunter use, but based on data contained in a 1973 T.O.R.P.S. (Tourist and Outdoor Recreation Planning Study) survey (Cox, 1971) a 13.2% participation in interpretive type activities might be reasonable, resulting in a demand of 49,750 user days per year. It is calculated that the special uses identified below will contribute to the 49,750 user days per year as follows:

1. There are 4,600 secondary students and 8,000 elementary students within Huron County; a 50 percent participation for outdoor recreation classes would represent 6,000 education user days per year.
2. Visitor demand for special wildlife viewing purposes during peak migration periods was estimated at 7,000 user days per year.
3. Special events, such as dog trials, could result in a demand up to 2,250

user days per year.

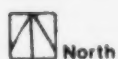
Appendix 7 summarizes use by activity and by season.

No camping facilities are planned for Hullett since there is ample provision in neighbouring provincial parks, conservation areas and private campgrounds. Point Farms Provincial Park, 27 km to the west, has 200 (1984) campsites. Pinery Provincial Park and Ipperwash Provincial Park, situated approximately 56.4 km southwest of Clinton, provide a combined total of 1,351 (1984) campsites. There are also approximately 400 campsites at conservation areas within the market area, and further facilities are provided at privately operated campgrounds. In 1974, it was estimated that within Huron County alone there were 2,400 campsites. Use of the Hullett Provincial Wildlife Area as a recreational area in the spring and fall might encourage private campground owners to extend their operative season.

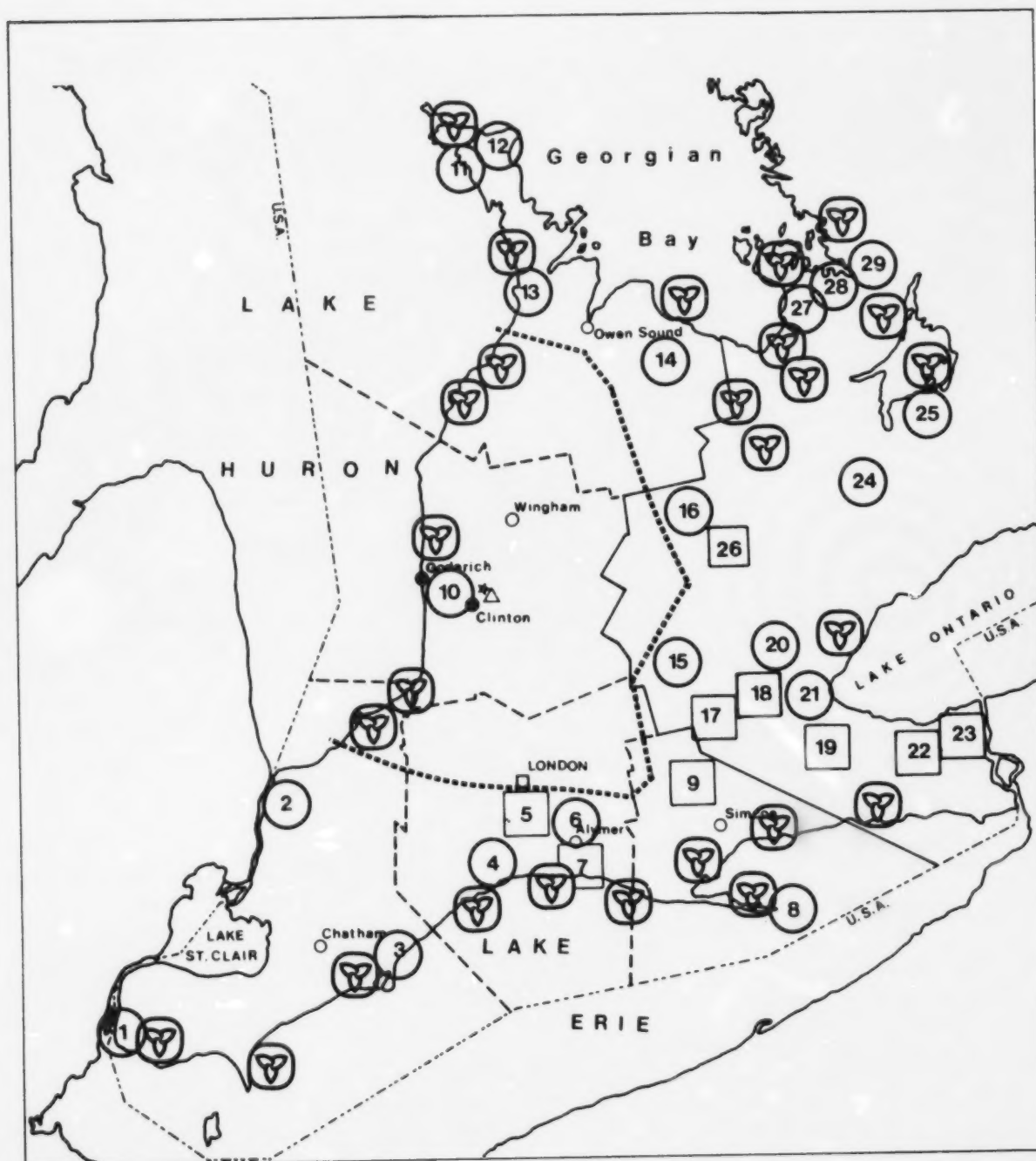
The Hullett Provincial Wildlife Area is closely situated to the provincial highway system, Highway 8 lies 2.0 km to the south of the area and Highway 4 is 2.0 km northwest. Gravelled township roads link the wildlife area to these highways.

Relation of H.P.W.A to other Wildlife Areas and Provincial Parks

Figure 6



0 50 100km



LEGEND



Provincial Parks



Provincial Wildlife Areas



Wildlife Extension

..... 1.5 Hour Travel Isochron

- | | |
|-------------------|---------------------|
| 1 HOLIDAY BEACH | 16 LUTHER MARSH |
| 2 STAG ISLAND | 17 VALENS |
| 3 RONDEAU | 18 BEVERLY SWAMP |
| 4 FINGAL | 19 BIMBROOK |
| 5 AYLMER PONDS | 20 CHRISTIE RESERVE |
| 6 AYLMER | 21 CROONS HOLLOW |
| 7 HAWK CLIFF | 22 MUD LAKE |
| 8 LONG POINT | 23 WILLOUGHBY SWAMP |
| 9 WATERFORD LAKES | 24 HOLLAND MARSH |
| ★ 10 HULLETT | 25 SIBBALD POINT |
| 11 ST. EDMUNDS | 26 ORANGEVILLE |
| 12 BRUCE | 27 TINY MARSH |
| 13 RANKIN | 28 WYE MARSH |
| 14 KOLAPORE | 29 MATCHEDASH BAY |
| 15 PUSLINCH | |

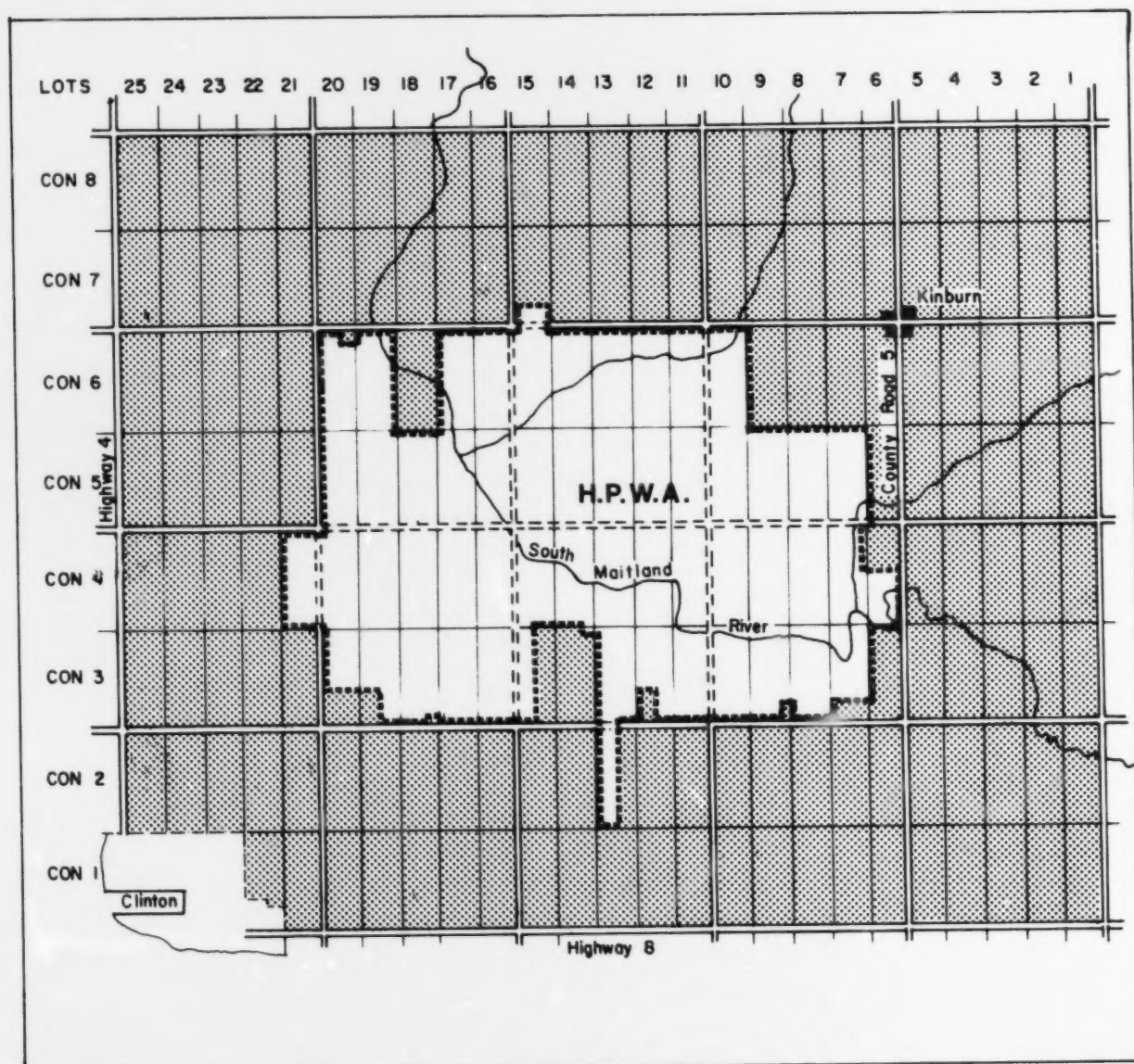
Potential Hunting and Wildlife Viewing Area on
Private Land Peripheral to H.P.W.A.

Figure 7



North

0 1 2km



LEGEND

 Peripheral

APPENDIX 6

DEVELOPMENT

Habitat Development

In November, 1979 the Ministry of Natural Resources signed a 99 year agreement with Ducks Unlimited Canada to design, construct and maintain the marshes at the Hullett Provincial Wildlife Area. The possible development alternatives included the following:

1. to utilize the landbase as it naturally exists for the production of wildlife;
2. to utilize the landbase as it presently exists with the addition of a system of small dug ponds and artificially impounded ponds being created where feasible within the area;
3. to construct a dam in the northwest section of the property and impound water as a result of natural runoff conditions;
4. to construct a dam in the northwest sector of the property and subdivide the floodplain lands, by means of a dyke system, into a set of one major and several minor sub-impoundments within which water levels can be manipulated in response to local weather conditions and needs of waterfowl;
5. to construct an extensive system of dykes parallel to the river subdivided into several large impoundments that would utilize spring meltwater and existing drains to augment water supply in dry seasons and to permit manipulation of water levels in response to changes in quality of marsh habitat.

After engineering and hydrologic studies by Ducks Unlimited Canada and the Ministry of Natural Resources, considering both the upstream and downstream users of the South Maitland River, alternative 5 was selected, as the preferred one. This system allows flexibility in the manipulation of water levels while the normal flows in the river are unaffected. The remaining floodplain along the river will contain periodic floods. During spring floods, water can overtop the low dykes of Pools A and 1 and also flow back through the ditch between Pools 2 and 3 to be contained in Pool B (Figure 8). Because of the necessity to maintain full control over water levels in the major impoundments (Pools 2,3,4) the dykes were designed to exclude water from a 100-year flood. Flap gates installed at the exit of each outflow control structure allows the added flexibility of utilizing or excluding floodwaters from the river as required for management purposes.

The main supply of water for Pools 2, 2A, 2B, 3 and 4 comes from the North Drain and two small ditches along the north side of Pools 2A and 2B. Pools 1 and A will be supplied by spring runoff and the South Maitland River during high flood periods.

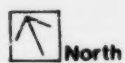
Construction of the dyking system began in 1979 and was completed in November 1983. The 1979 agreement was retroactive to July 1, 1978, to cover work that Ducks

Unlimited Canada already had in progress. Pool 2A was first filled in 1982, Pools 2B and 2 were flooded initially in 1983. The remaining four pools were flooded in the spring of 1984. Marshes in the five pools north and east of the river cover approximately 630 ha and those to the south and west are about 90 ha in size at their normal operating levels. The smaller, satellite ponds ranging in size from .5 to 11 ha in the upland areas result in an additional 42 ha of manageable wetlands. This system permits a variety of management practices to be carried out in relation to waterfowl production and migration, as well as enhancing the habitat for upland wildlife.

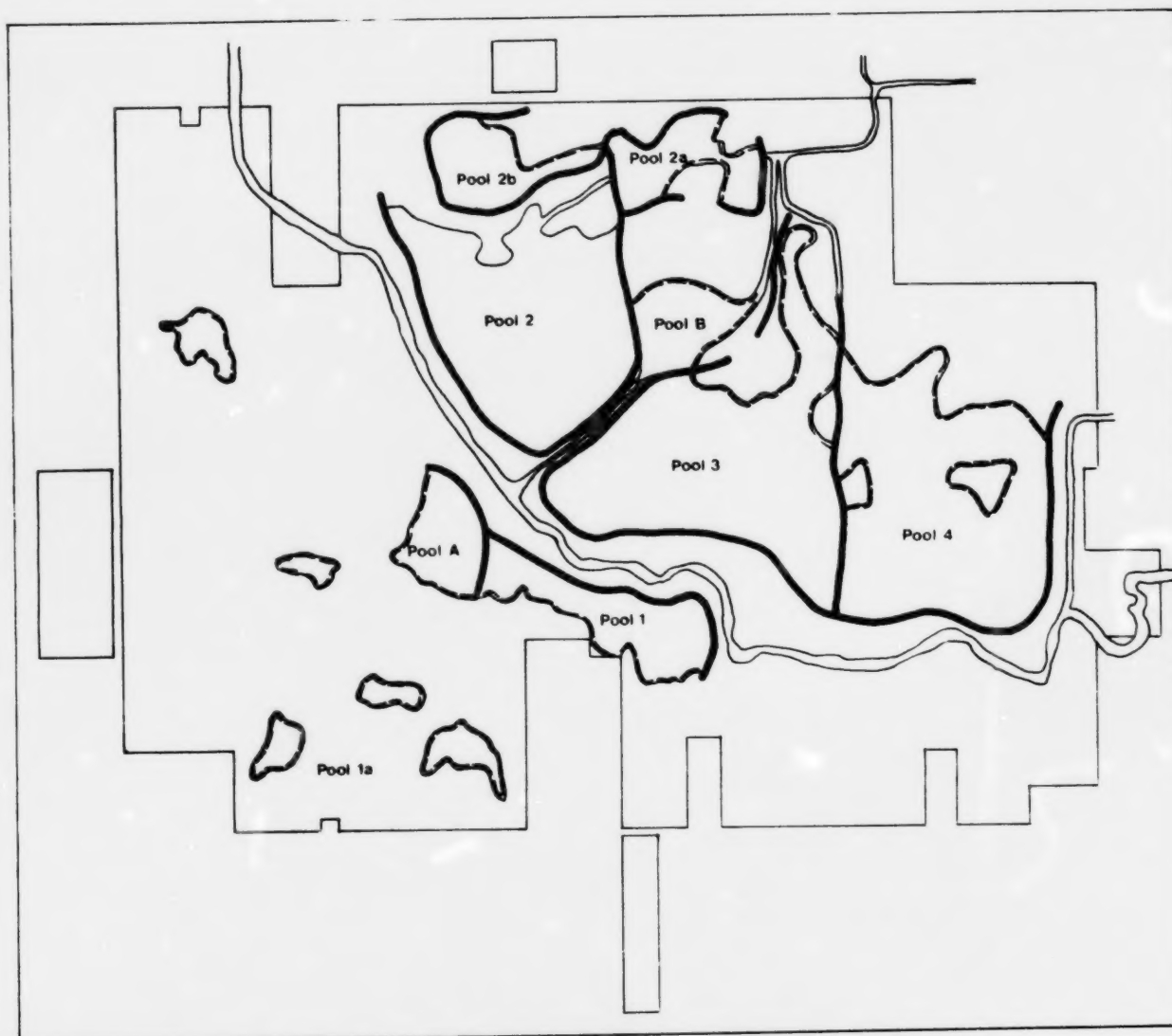
Two baited sanctuary zones will be maintained in disparate locations with no public access from August 1st until the end of waterfowl hunting season. Non-baited refuge areas will also be established based on waterfowl behaviour.

The primary waterfowl hunting areas are in the marshes to the north and east of the river. These areas were designated as "Zone A" and controls on hunting were regulated under the Game and Fish Act in 1982. The remainder of the wildlife area was designated as "Zone B" where both upland game and waterfowl may be hunted by regulations which control the number of hunters per unit area.

The demand for time and space for dog training and licenced dog trials has been steadily increasing since 1979. One field trial organization has set up a permanent club house on private land and maintains the farmstead site in Lot 20, Concession V for their use. The first licenced retriever trial at Hullett will be held in 1984 and it is expected to become an annual event. Present facilities are expected to be adequate for these events within the time frame of this plan.

Dyke and Ditch System**Figure 8**

0 1 km

**LEGEND**

Dykes

Flooded Area

APPENDIX 7

Estimate of Use by User Groups by Season

	Spring Mar.-May)	Summer (June-Aug.)	Fall (Sept.-Nov.)	Winter (Dec.-Feb.)	Total
Hunting	0	0	6,200	1,400	7,600
Dog Trials/Training	500	1,000	750	0	2,250
Education	3,000	0	1,000	2,000	6,000
Viewing	2,750	2,000	2,000	250	7,000
Interpretation	12,000	16,000	4,000	2,500	34,500
Total	18,250	19,000	13,950	6,150	57,350

APPENDIX 8

Expenditures for Development Phase 1970 to 1983

Note: All costs for design, construction and development of marshes was provided by Ducks Unlimited Canada.

Land Acquisition Costs

\$ 875,000

Development costs primarily provide by D.U. Canada and M.N.R.:

- water facilities (dams, dykes, peripheral ponds)
- biological development (islands, rafts, nest boxes)
- buildings (additional maintenance structures, interpretative buildings)
- roads (parking lots, launching ramps, internal roads)
- recreational development (nature trails, viewing stands, docks)
- utilities (cribbing of hydro lines)

\$1,500,000

Equipment costs including:

- canoes
- pumps
- vehicles
- snowmobiles, ATC
- farm equipment (tractor, mowers, etc.)

\$ 65,000

Total

\$2,440,000**Average Annual Operating Costs such as:**

- maintenance (trails, dykes, buildings, roads, etc.)
- wildlife management (habitat improvement, surveys)
- security
- recreation (schools, naturalists, etc.)
- conservation education (films, pamphlets, etc.)

Total

\$ 65,000

EARTH SCIENCE INVENTORY CHECKLIST

NAME Seaforth-Wawanosh Moraines		MAP NAME Seaforth	MAP NUMBER 40P/11	UTM REFERENCE 62-28-	
COUNTY Huron		LAT.	LONG.	ALT.	MIN. MAX.
TOWNSHIP Hullett					
LOT CONCESSION Hullett 6 to 15 III 1 to 15 II 1 to 15 I					
ca. 2000 acres ca. 800 ha.					
OWNERSHIP					
ADMINISTRATION					
MNR REGION & DISTRICT SW-Wingham		CONSERV. AUTH. Ausable-Bayfield			
AERIAL PHOTOGRAPHS - BASEMAPS					
<u>Year</u> <u>Roll</u> <u>Flight Line</u> <u>Numbers</u> 					

EARTH SCIENCE FEATURES

The Wawanosh Kame Moraine meets the Seaforth End Moraine at this site. The Seaforth Moraine is composed of Rannoch Till deposited by the Huron ice lobe. The Wawanosh Moraine was formed between the Georgian Bay ice lobe and the Huron ice lobe. Small ridges formed in the Seaforth Moraine may indicate annual retreat rates.

SENSITIVITY

There are some active gravel pits in the area.

SIGNIFICANCE

The scientific and interpretive values of the Seaforth End Moraine ridges and the meeting of this moraine by the Wawanosh Kame Moraine indicates the site is very important. Therefore this site has been proposed as a candidate nature reserve.

MAJOR REFERENCES

Cooper, Fitzgerald and Clue, 1977

DATE COMPILED

February, 1980

COMPILER

G. S. Cordiner

SURFICIAL GEOLOGY

Major glacial advances and retreats in the Great Lakes region have been assigned to three substages - Early, Middle and Lake Wisconsin (Dreimanis and Karrow, 1972). Early Wisconsin tills occur at depth throughout southern Ontario representing advances by the Erie, Huron and Georgian Bay ice lobes. Middle Wisconsin sediments consist of lacustrine silts and sands with minor organic deposits, indicating that glacial activity was not extensive during this substage. Events during the Lake Wisconsin generated the most varied and complex tills in southern Ontario produced by oscillating ice lobes.

Only evidence of the Late Wisconsin Substage (23,000 - 10,000 yr. B.P.) has been found in the Seaforth map area. During the Port Bruce Stadial (15,000 - 14,000 yr. B.P.) the Mitchell, Dublin and Seaforth End Moraines were formed by the Huron ice lobe. The moraines are all sub-parallel to the Lake Huron shoreline and are all composed of Rannoch Till (Cooper, et al, 1977).

The Wawanosh Kame Moraine was formed during the Port Bruce Stadial while the Rannoch ice (Huron lobe) and Elma ice (Georgian Bay lobe) were in close proximity (Cooper, et al, 1977). Both ice masses contributed to the building of this Kame moraine which was subsequently overridden by the Rannoch ice.

According to Cooper, et al, (1975) the north-south eskers are directly associated with the deposition of Elma Till (Georgian Bay ice lobe) while the east-west eskers are directly associated with the deposition of the Rannoch Till (Huron ice lobe).

The drainage of glacial meltwater in the area has left a number of local glaciofluvial outwash deposits, mainly sand, particularly in the northern areas.

SIGNIFICANCE

Generally the Seaforth map area is a rolling to flat till plain dominated by moraine topography (Cooper, et al, 1977).

The Seaforth Moraine extends from the St. Mary's map area north into the Seaforth map area where it meets the Wawanosh Moraine. According to Karrow (1977, p. 14) the Seaforth Moraine in the St. Mary's map area has a sinuous morphology suggesting that formation took place in an environment of thinner ice conditions and greater response to the local topography. In the St. Mary's map area, the morainic ridges broaden to a belt of closely-spaced low ridges each probably marking short duration ice-marginal positions (Karrow, 1977). In this zone, the ice margin apparently retreated more rapidly and possibly represent annual accumulations since the distances between ridge crests are 120 to 150 km (400 to 500 feet), a reasonable amount for an annual retreat rate (Karrow, 1977).

In the Seaforth map area, the Seaforth Moraine meets with the Wawanosh Moraine. Ice-contact stratified sediments present in the Wawanosh were apparently deposited jointly by both the Rannoch (Huron lobe) and Elma (Georgian Bay lobe) at a time when the two ice sheets were in close proximity (Cooper, et al, 1977). At the site, the Rannoch Till overlies the main body of the ice contact sands and gravels of the Wawanosh Moraine. The Rannoch Till was deposited by the Huron lobe during the Port Bruce Stadial (15,000 to 14,000 yr. B.P.) slightly later than the Elma Till (Georgian Bay ice lobe).

Although two names are used to separate the Wawanosh and Seaforth Moraines they are essentially the same moraine (Cooper, 1982, personal communication). Different environmental conditions of deposition necessitated the use of two names for the single feature.

RECOMMENDATIONS

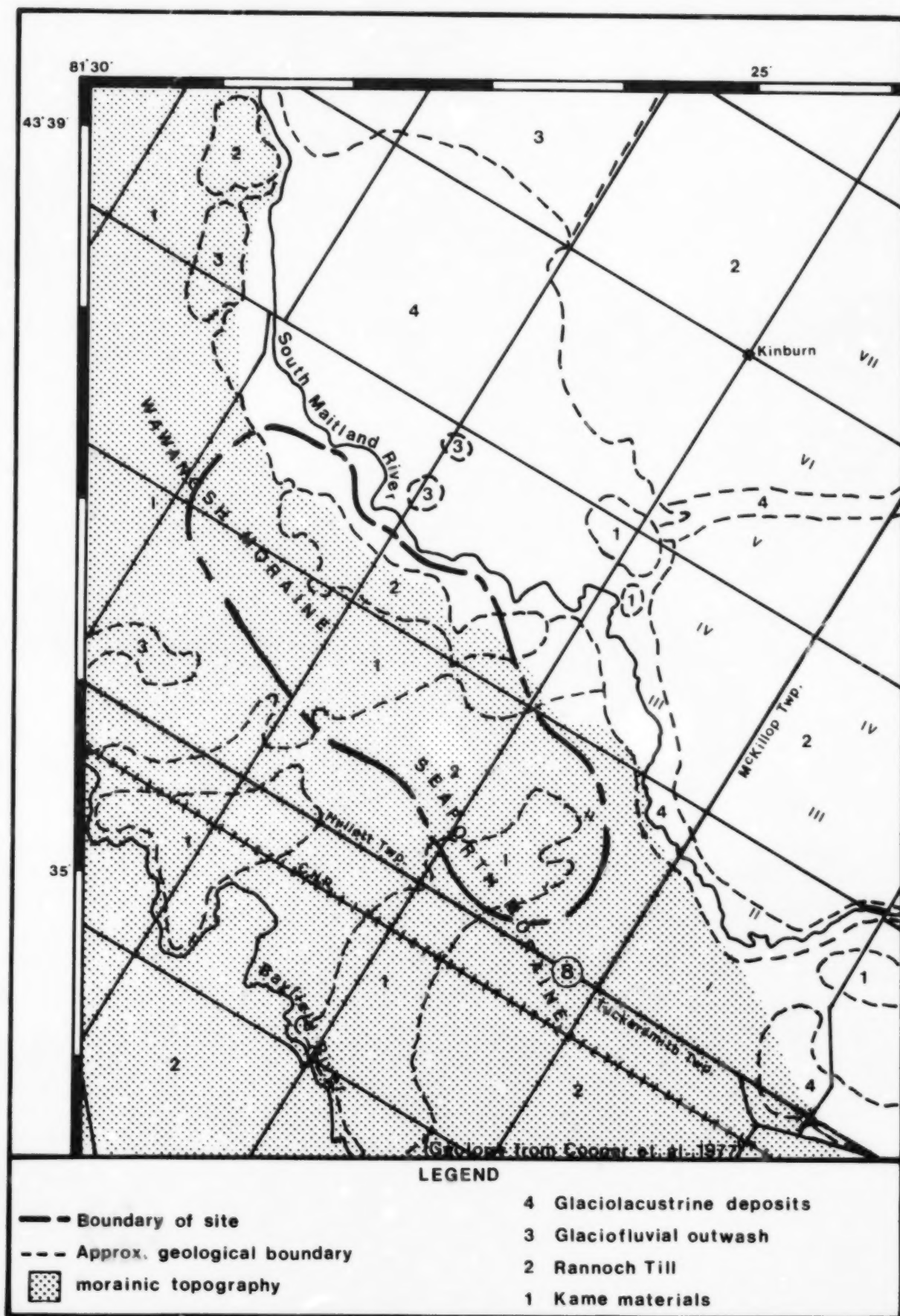
The ridge pattern of the Seaforth Moraine appears to extend from the St. Mary's map area into the Seaforth map area. The ridges have been observed although Karrow (1977) maintains that they are difficult to map at a scale of 1:50,000. Interpretation of the ridges is important to the understanding of the depositional environment of this part of the Seaforth Moraine. A more detailed scientific investigation should be done in order to extract the precise information concerning the glacial conditions at the time the Seaforth Moraine was deposited.

The Wawanosh Kame Moraine meets the Seaforth End Moraine at the site. This feature illustrates and emphasizes the processes of deglaciation in the Seaforth area. The moraine represents different types of deposition under different environmental conditions at about the same time.

The size of this site is intended to represent the change in topography of the moraine from the hummocky terrain in the west to a more gentle moraine topography in the east. It may be necessary to further refine the boundaries of the site once the Ontario Geological Survey releases the full report done on the area.

The northeastern portion of the site is located in the Hullett Conservation Area of the Ausable-Bayfield Conservation Authority. A liaison between Parks Branch and the Conservation Authority should be established to explain the significance of this site and the objectives of the earth Science Framework.

The scientific and interpretive values of this site cannot be overemphasized. The moraine clearly illustrate glacial processes and are excellent examples of glacial landforms. Consequently, this site should be designated as a candidate nature reserve based upon its scientific and interpretive values to the history of the deglaciation of the Seaforth map area.



Seaforth-Wawanosh Moraine
NTS 40P/11, Seaforth UTM 62-28-

APPENDIX 10

Compatible Activities in the
Hullett Provincial Wildlife Area

Possible Activity	Location	Season	Guidelines
Maple Syrup	Lots 18-20 Conc. 3 & 4	Spring	
Put and Take Fishery	Ponds south and west of south Maitland River	Spring	Depends upon availability of fish stock.
Tree Planting	North-west	Spring	Available for experimental plantation. Planting must benefit wildlife but still be viable for experimental purposes.
Hiking	Established trails, dyke system	Spring, Summer	Does not conflict with hunting seasons.
School and Group Tours	Established trails and viewing platform	Spring, Summer	Self-guided so staff time is not diverted from management work.
Bait fish Harvest	Five major impoundments South Maitland River	Spring, Summer, and Fall	Does not interfere with waterfowl production. Harvest quotas will be assigned. Gear type will be controlled.
Wildlife Shrub Planting	Throughout	Spring	Presently close to saturation point. Limit to replacement in established rows.
Tree Seed Orchard	Lot 18, Conc. 5 Lot 19, Conc. 4	Spring and Summer	Any white pine planting must not be within 1/2 kilometer of the orchards.
Agriculture	Throughout, excluding five impoundments	Spring, Summer & Fall	Done in such a manner to benefit wildlife production.
Warm Water Sport Fishery (largemouth bass)	Five major impoundments South Maitland River	Summer	Restrictions on anglers in the impoundments may be necessary so they do not disrupt waterfowl rearing activities and hunting.

Dog trials - bird dog and retriever	West of South Maitland River	Summer	Location and timing important so activity does not negatively impact on other activities.
Sand and Gravel Excavation	Lot 13, Conc. 2 Lot 20, Conc. 3	Summer	Show there will be no detrimental impact on quality or integrity of A.N.S.I. Specific conditions consistent with goal and objectives of H.P.W.A. will be identified in the operating plan.
Waterfowl, upland game and deer hunting	Throughout where appropriate	Fall and Winter	Seasons, hunter numbers, and bag limits set to maintain healthy wildlife populations.
Fox Hunting and Raccoon Chasing	West of South Maitland River	Fall	Areas where deer are not commonly found. Sufficient handlers present to retrieve hounds.
Trapping muskrat, raccoon, fox	Throughout	Fall Winter Spring	Harvest surplus animals, predator control, and removal of nuisance animals, protection of dykes and control structures.
Cross-country skiing	Established trails	Winter	Work towards grooming done by volunteer group(s).
Snowmobiling	Established trail	Winter	Work towards grooming done by volunteer group(s). Allow activity only in areas where deer are not commonly found.
Habitat Improvement (including water level control and drawdown)	Throughout where appropriate	All	Maintain quality wildlife habitat where it exists and provide quality habitat where it has deteriorated or where specific components are lacking.
Scientific Study and Surveys	Throughout	All	Must be consistent with management goal and objectives of H.P.W.A.
Target Range	Lot 15 Conc. IV	All	Target practice not permitted outside sand pit.

Forest Management	Throughout	All	Sound forest management practices will be employed.
Earth Science Feature Protection	Wawanosh-Seaforth Moraines	All	No activities permitted which compromise quality or integrity of feature. Further study required to refine extent of representative feature(s).
Heritage Appreciation	Throughout	All	Promote and facilitate activity while not interfering with wildlife production.
Wildlife Viewing	Throughout mostly from viewing platform and dyke tops in marsh areas	All	Promote and facilitate activity while not interfering with wildlife production.
Turtle Harvest	Major impoundments South Maitland Valley	To be established	Harvestable surplus may become available after H.P.W.A. has been in full operation.
Frog Harvest	Major impoundments South Maitland River	To be established	Harvestable surplus may become available after H.P.W.A. has been in full operation.
Mineral and Petroleum Exploration (excluding drilling)	Throughout	To be established	Conditions to ensure minimal impact on wildlife production will be developed upon receipt of application for activity.
Oil, Gas and Mineral Development (including drilling)	Outside impoundments and wetlands	To be established	Conditions to ensure minimal impact on wildlife production will be developed upon receipt of application for activity.
Canoeing	River and main impoundments	Spring Summer Fall	No access to marshes during waterfowl brooding season